



Chapter 1. Introduction and Methods

Purpose and Goals

This is the second annual National Healthcare Quality Report (NHQR). In its reauthorization legislation, Congress directed the Agency for Healthcare Research and Quality (AHRQ) to produce an annual report on health care quality in the United States (Section 913(b)(2) of the Public Health Service Act as amended by Public Law 106-129). The National Healthcare Quality Report was designed and produced by AHRQ, with support from the Department of Health and Human Services (HHS) and private-sector partners, to respond to this legislative mandate.

The first NHQR was issued in December 2003. This second annual report builds on the first year “baseline” report and tracks trends and progress in health care quality. The purpose of the report is to measure the state of health care quality, and thereby contribute to improvements in care for all Americans. In addition to summarizing changes in health care quality in the Nation, data in the 2004 report provide insight into opportunities for improvement in care. Finally, ongoing work on the NHQR measure set continues to allow HHS to aid in the long-term goal of aligning quality measurement efforts.

Changes in the 2004 Report

There are two substantial changes in this year's report that were undertaken to enhance its readability and utility. The first is a focus on highlight measures with in-depth analysis, rather than broad, but sparse, coverage of all 179 measures. The second is a shift in presentation toward less narrative and more charts with bulleted key findings. Note that data for all the measures are included in tables at the end of each section. Other changes include:

- An improved online version of the report, including easier access to tables and hyperlinks to data and sources (www.qualitytools.ahrq.gov).
- The addition of summary measures in many areas. Summary measures as used in the report are either summarizations of information across multiple measures (i.e. median change across a set of measures) or a composite measure assessing the percent of patients who received a range of recommended interventions (i.e. the percent of patients who received all recommended diabetes management interventions.)
- An addition of 31 new measures, deletion of 9 measures, and changes to 19 measures. These measure updates respond to new science and consensus on health care quality measures for clinical conditions like diabetes, heart disease, respiratory disease, and other priority areas.
- Additional derivative products including workbooks and fact sheets, in both printed and online format, that focus on cross-cutting and important issues of health care quality.

Additional detail on these changes is presented below.



How This Report Is Organized

The NHQR consists of the report itself and two appendixes.ⁱ The report itself is organized as a chartbook into the following chapters:

- **Chapter 1: Introduction and Methods** documents the organization and major changes from the 2003 report and summarizes the data sources for the report.
- **Chapter 2: Effectiveness** examines quality of care for nine separate clinical conditions or care settings. These condition areas (listed subsequently) were developed and approved for use in the 2003 report and are based largely on Healthy People 2010 (HP2010) condition areas. The section also includes a discussion of nursing home and home health care. In developing future reports, AHRQ and its partners will examine the list of conditions tracked in this chapter and alter or add to them as appropriate.
- **Chapter 3: Patient Safety** tracks measures of patient safety, hospital-acquired infections, injuries or adverse events due to medical care, complications of health care, and medication safety.
- **Chapter 4: Timeliness** examines both the delivery of time-sensitive clinical care and patients' perceptions of the timeliness and accessibility of their care.
- **Chapter 5: Patient Centeredness** incorporates the patient's perspective into the report by tracking patients' experiences with care for both routine and emergency services.

The two appendixes are available online:

- **Data Tables** provides detailed tables for most measures analyzed for the report, including both measures highlighted in the report text and measures examined but not included in the text. There are two primary types of tables: 1) national tables, which present a national estimate and breakdowns by sociodemographic and other characteristics; and 2) State tables, which present a national estimate and estimates for each State. In all cases, where estimates are provided, standard errors for those estimates are also provided to facilitate additional statistical testing.
- **Measure Specifications** provides information about how to generate each measure analyzed for the report. It includes both measures highlighted in the report text as well as other measures that were examined but not included in the text. This appendix is divided into two parts: 1) specifications for each measure and 2) specifications for each data source used in the report.

This chapter describes the goals and organization of the report, important changes since the 2003 report, and methodological steps taken in analysis and synthesis of data for the report. Subsequent chapters cover the components of health care quality—effectiveness, patient safety, timeliness, and patient centeredness. Each chapter is subdivided as follows:

- **Importance and Measures** provides summary information on the background and impact of a particular disease area or component of quality. Also presented is a description of how the report measures quality in this area and the measures that are “highlighted” in the subsequent charts.
- **Findings** presents one or more charts on key highlight measures with bulleted findings on major points.

ⁱ The appendixes for the report are available online at www.qualitytools.ahrq.gov.



For information on the specifications for the measures and the data sources, readers are encouraged to consult the Measure Specifications Appendix noted above. For additional information on the rationale for selection of the measures and detailed tables for all measures, readers are encouraged to consult the Tables Appendix. The Tables Appendix also summarizes the statistical testing procedures conducted for the detailed tables in the NHQR.

How the Report Was Created

AHRQ has received ongoing input from numerous HHS agencies and offices that are represented on an Interagency Workgroup formed to provide advice on the design of the report. AHRQ also received considerable external input through several mechanisms, including AHRQ's National Advisory Council, a subcommittee of which has been organized under the leadership of Dr. Don Berwick to provide ongoing input on the report. The final 2004 measure set builds on extensive work conducted for the development of the 2003 report measure set.

In order to select measures for the 2003 report a “call for measures” was sent to all relevant Federal agencies. The Institute of Medicine (IOM) issued a complementary call for measures to the private sector. Those submitting measures also had to submit the name of a proposed data set. More than 600 measures were submitted for consideration in response to these calls.

The NHQR Interagency Workgroup mapped the candidate measures into the NHQR conceptual framework. The measures within each category of care were evaluated for inclusion in two parts:

1. Measures were selected to maintain consistency with existing consensus-based measure sets where possible.
2. The workgroup assessed candidate measures using the following criteria:¹
 - **Importance.** What is the impact on health associated with the health problem assessed by the measure? Are policymakers and consumers concerned about this area of health care quality? Can the health care system meaningfully address this aspect or problem?
 - **Scientific soundness.** Does the measure actually reflect what it is intended to measure? Does the measure provide stable results across various populations and circumstances? Is there scientific evidence available to support the measure?
 - **Feasibility.** Is the measure in use? Can information needed for the measure be collected in the scale and time frame required? How much will it cost to collect the data needed for the measure? Can the measure be used to compare different population groups?

A particular effort was made to include both process measures that assess what happens to patients during their care and outcome measures that track what ultimately happens as a result of that care.

In order to update the measure set for the 2004 report, AHRQ, through the NHQR Interagency Workgroup, conducted a review process from December 2003 through April 2004 to propose and analyze possible changes to the 2003 measure set. The revised measure set was then published for public comment in the *Federal Register* on May 28, 2004, and amended accordingly. Additionally, a consultant performed an evaluation of the development process of the first NHQR and the presentation and dissemination of the report, including those involved in the process as well as the intended audiences. The results of these studies, the comments received during the clearance process and those from other stakeholders, and the substantial input from the Interagency Workgroup shaped the changes made in the second report.

Conceptual Framework

The NHQR is based on a conceptual framework developed for AHRQ and HHS by the Institute of Medicine in 2001. In its report to AHRQ, the IOM reinforced components of health care quality that have been used in numerous other contexts. Quality health care means doing the right thing, at the right time, in the right way, for the right people—and having the best possible results.² Quality health care is care that is:

- **Effective**—Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit.
- **Safe**—Avoiding injuries to patients from the care that is intended to help them.
- **Timely**—Reducing waits and sometimes harmful delays for both those who receive and those who give care.
- **Patient centered**—Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

The conceptual framework designed by the IOM (see Figure 1.1) is a matrix including components of health care quality (e.g., effectiveness, safety, timeliness, patient centeredness, as well as equity) and patient needs (e.g., staying healthy, getting better, living with illness or disability, coping with the end of life). The measures that populate this matrix are both process and outcome measures, in keeping with recommendations from the IOM. This mix allows the report to present clinically specific, “actionable” measures of health care quality that can be changed in the process measures and “end result” measures that track what people ultimately experience in their interactions with the health care system.

The matrix is not evenly represented by measures. For example, the majority of measures are in the effectiveness component, and there are no measures in the end of life category. It is not clear what the correct distribution of measures is, and more thought will be given to whether the matrix needs updating in future reports. Additionally, the priority conditions identified by the IOM in its recent work, *Priority Areas for National Action: Transforming Health Care Quality*, will receive increased focus in future years.³

Figure 1.1. NHQR framework

| Components of Health Care Quality | | | | |
|-----------------------------------|---------------|--------|------------|----------------------|
| | Effectiveness | Safety | Timeliness | Patient Centeredness |
| Health care needs | | | | |
| Staying healthy | | | | |
| Getting better | | | | |
| Living with illness or disability | | | | |
| End of life care | | | | |

Source: Institute of Medicine. *Envisioning the National Health Care Quality Report*. 2001.



New in This Report

Changes to Report Format

The move from a longer text-based report to a shorter chartbook format resulted from input received during the Departmental clearance process and public review of the 2003 report and its companion report, the National Healthcare Disparities Report (NHDR). This format is well suited to summarizing and synthesizing data findings across the wide range of clinical conditions and dimensions tracked in the NHQR and NHDR. In 2004, both reports have adopted this chartbook presentation format.

This format change necessitates a more selective approach to highlighting measures in the text as only a limited number of measures/presentations of measures can be made in a chartbook format.

In addition to the general criteria described in the previous section, the NHQR and NHDR AHRQ team applied secondary criteria for selecting measures with priority given to measures with:

- Current data
- Proximity to care (i.e., process measures preferred to outcome measures, where possible)
- Clinical significance
- Methodological soundness
- High prevalence
- Variability over time, across States, or among relevant subpopulations
- Nationally representative data
- Specificity (i.e., measures that are more specific for particular target populations)

In order to make the selection of “highlight” measures, AHRQ worked closely with Departmental colleagues through the NHQR Interagency Workgroup to review the initial selection of highlight measures and determine their appropriateness for use in the 2004 report.

New Data and Data Sources

The report explicitly relies on existing measures. Also, the report tracks selected conditions using measures for which national data are available. It does not directly address facility or individual practitioner performance, consumer choice, or provider accountability. As noted, the report addresses four dimensions of quality and, within the effectiveness dimension, nine clinical condition areas as presented below:

Dimensions of quality

- Effectiveness
- Safety
- Timeliness
- Patient centeredness

Clinical effectiveness areas

- Cancer
- Diabetes
- End stage renal disease
- Heart disease
- HIV/AIDS
- Maternal and child health
- Mental health
- Respiratory diseases
- Nursing home and home health care



This report is intended to track quality for the Nation over time. As such, it must rely on readily available, reliable and valid, regularly and consistently collected data at both the national and State levels. Wherever possible, these requirements were applied to available data sources and, as such, they restricted the data sources that could be used for the report. When the call for measures for the 2003 report was made, there was also an accompanying request for data sources for the proposed measures. During the developmental phase of the project, the workgroup devised a two-tiered scheme for categorizing possible data sources for the report. Each potential data source was examined and classified according to the following criteria:

| Tier I: Substantively relevant and nationally representative— | Tier II: Substantively relevant but— |
|--|---|
| <ul style="list-style-type: none">• For the target population under consideration.• For a given population such as civilian, resident, noninstitutionalized, nursing home residents, etc.• And accurate and reliable with specified relative error.• With the capacity for multiple levels of detail.• With acceptable response rates. | <ul style="list-style-type: none">• Adjusted to compensate for limitations in national representation.• Data representative at the subnational level (such as State or Metropolitan Statistical Area).• Data not nationally representative but substantively important. |

This system of categorization helped to identify established, national data sources that are the standard for providing national estimates over time for the report. The data from these data sources provide estimates for the U.S. civilian noninstitutionalized population.

Although the 2003 NHQR included nearly a dozen databases, gaps in measurement existed. This year, new sources of data were identified and added to help fill these gaps. As in the 2003 report, standardized suppression criteria were applied to all databases to support reliable estimates.ⁱⁱ New data added this year come from:

- Medicare Patient Safety Monitoring System, which includes information from chart reviews about patient safety events among hospitalized Medicare beneficiaries.
- Healthcare Cost and Utilization Project, which now also contributes Inpatient Quality Indicators related to mortality in addition to the Prevention Quality Indicators and Patient Safety Indicators that were contributed to the 2003 report.

In addition, adjustments for survey design complexities for individual data sources were accounted for in the production of the survey estimates, standard errors, and significance tests. Detailed information on data sources is presented in the Measure Specifications Appendix.

ⁱⁱ Estimates based on sample size fewer than 30 or with relative standard error greater than 30% were considered unreliable and suppressed. Databases with more conservative suppression criteria were allowed to retain them.



New and Continuing Analyses Issues

Trend and summary analysis. A particular emphasis in this year's report is the analysis of trends in data over time. Although this analysis is an addition to the 2004 report, it is limited because of the limited amount of data available to make such comparisons in the second report. Special analyses were undertaken for summarizing the data across the measure set for presentation in the Highlights section of this report. These include a summary of median change over time across all measures with trend data, a presentation of the distribution of change in the measures from data presented in the 2003 report versus the latest year data presented in the 2004 report, and a presentation of relative differences in key measures over time and between States. Notes on these analyses are presented in the Highlights section.

With a range of conditions and measures, AHRQ maintains a systematic process for reviewing data and assessing relevant differences as they are presented in the chapters that follow. Reported comparisons are for statistically significant differences unless otherwise noted. Statistical testing was conducted on the estimates. The tests done were two-tailed t-tests of significance at the alpha level of 0.05. All data highlighted in this report meet this statistical criterion. The testing included these steps:

- For national tables, differences between estimates for subgroups and the identified comparison (reference) group were tested for statistical significance.
- For national tables with data over time, the least recent year was used as the reference and subsequent years were tested versus that reference year.
- For State tables, States were compared with the national average. (Readers should note that these differences between States and the national average were computed solely to highlight opportunities for improvement nationally rather than as assessments of the performance of individual States.) In response to specific input from the NHQR Interagency Workgroup, State comparisons in the 2004 report were made using quartiles.

Data suppression. Sometimes not all the data collected from surveys, medical records, or administrative sources can be presented. The rule employed for data suppression for this report was to adhere to the rules specified by the data source from which the measure was derived. (Detailed information on each of the data sources is contained in the Measure Specifications Appendix.)

For most data sources, there were two main data suppression criteria:

1. Cell values based on unweighted N less than 30, and
2. Relative standard errors greater than 30%, when appropriate.

Details on the data suppression approaches for the NHQR data are presented in the preface to the Tables Appendix.



References

1. Institute of Medicine. *Envisioning the national health care quality report*. Washington, DC: National Academies Press; 2001.
2. Agency for Healthcare Research and Quality. Your guide to choosing quality health care. Rockville, MD: U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality; 2001. Report No. 99-0012. Available at: <http://www.ahrq.gov/consumer/qualguid.pdf>. Accessed July 26, 2004.
3. Institute of Medicine. *Priority areas for national action: transforming health care quality*. Washington, DC: National Academies Press; 2003.